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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,845	09/18/2003	William Berardi	02103-556001 / AABOSW23	8903

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EXAMINER	
LAO, LUN S	

ART UNIT	PAPER NUMBER
2615	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/665,845	BERARDI ET AL.	
	Examiner	Art Unit	
	LUN LAO	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. This action is in response to the amendments filed on 12-21-2007. Claims 1, 11, 15 and 19 have been amended and claims 18-19 have been added and claim 10 has been cancelled. Claims 1-9 and 11-20 are pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03-25-2008 has been entered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3-5, 9, 11-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rocha (US PAT. 6,118,883) in view of Markow (US PAT. 6,175,489). Consider claim 1 Rocha teaches that a method comprising:

controlling audio electrical signals to be provided to electroacoustical transducers of an array to achieve reduced cancellation of acoustic signals produced by the transducers at frequencies below F_D = c/2D in which D is an inter-transducer distance (because the entire frequency is reduced in acoustic signal canceling and thus includes the frequency range that is below F_D and applicant does not point out the limitation below F_D only, therefore, it meets the limitation as recited in claimed) and c is the speed of sound, the controlling being done as a function of at least one of a volume control (see fig. 3 (108)) or a detected signal level, the reduction in cancellation changing a radiated acoustic power spectrum of the array at frequencies below F_D (see figs. 3-4 and col. 4 line 10-col. 5 line 48); but Rocha does not explicitly teach equalizing the audio electrical signals based on the change in the spectrum.

However, Markow teaches equalizing the audio electrical signals below F_D based on the change in the spectrum (because the entire frequency includes the frequency range that is below F_D)(see figs. 2-4 and col. 4 line 50-col. 5 line 6 and col. 6 line 35-col. 7 line 67).

Rocha as modified by Markow teaches equalizing the audio electrical signals below F_D based on the change in the spectrum.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Markow into Rocha to provide in order to enhance spatial sound impression to the listener.

Consider claims 3-5 Rocha as modified by Markow teaches the method of claim 1 in which the adjusting occurs prior to the controlling (in Markow see col. 6 line 25-col. 7

line 32) and the method which the change in the acoustic power spectrum resulting from the controlling of the signals is predicted, and the adjusting is based on the predicting(in Markow see col. 6 line 25-col. 7 line 32); and the method which the adjusting is based on a volume level selected by a user (in Markow see col. 6 line 25-col. 7 line 32).

Consider claim 9 Rocha teaches the method which the controlling of the audio electrical signals comprises adjusting a level of one of the signals over a limited frequency range(see figs. 3-6 and col. 4 line 10-col. 5 line 48).

Consider claim 11 Rocha teaches electroacoustical transducing apparatus comprising an input terminal to receive an input audio electrical signal(see fig.3), and a plurality of electroacousfical transducers in an array (102,104,106), mad circuitry constructed and arranged to generate and control two related output audio electrical signals from the input audio signal, wherein the output signals are coupled to said electroacoustical transducers of an array, and to achieve reduced cancellation of acoustic signals produced by the transducers at frequencies below $F_D = c/2D$(because the entire frequency is reduced in acoustic signal canceling and thus includes the frequency range that is below F_D and applicant does not point out the limitation below F_D only, therefore, it meets the limitation as recited in claimed), in which D is an inter-transducer distance and c is the speed of sound, the controlling being done as a function of at least one of a volume control (108) or a detected signal level, the reduction in cancellation changing a radiated acoustic power spectrum of the array at frequencies below F_D (see figs. 3-4 and col. 4 line 10-col. 5 line 48); but Rocha does not

explicitly teach equalizing the audio electrical signals based on the change in the spectrum.

However, Markow teaches equalizing the audio electrical signals below F_D based on the change in the spectrum (because the entire frequency includes the frequency range that is below F_D)(see figs. 2-4 and col. 4 line 50-col. 5 line 6 and col. 6 line 35-col. 7 line 67).

Rocha as modified by Markow teaches equalizing the audio electrical signals below F_D based on the change in the spectrum.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Markow into Rocha to provide in order to enhance spatial sound impression to the listener.

Claim 15 is essentially similar to Claim 11 and is rejected for the reasons stated above apropos to Claim 11.

Consider claims 12-14 Rocha as modified by Markow teaches the apparatus of which the circuitry comprises a dynamic equalizer(in Markow, reads on 325 microprocessor and see figs. 2-4 and col. 4 line 50-col. 5 line 6 and col. 6 line 35-col. 7 line 67); and the apparatus which the dynamic equalizer includes a pair of signal processing paths and a combiner to combine signals that are processed on the two paths (in Markow, see figs. 2-4 and col. 4 line 50-col. 5 line 6 and col. 6 line 35-col. 7 line 67); and the apparatus which the circuitry is also constructed and arranged to compensate for the change based on a volume level(in Markow, see figs. 2-4 and col. 4 line 50-col. 5 line 6 and col. 6 line 35-col. 7 line 67).

Claim 16 is essentially similar to Claim 12 and is rejected for the reasons stated above apropos to Claim 12.

Claim 17 is essentially similar to Claim 13 and is rejected for the reasons stated above apropos to Claim 13.

Consider claim 19 Rocha teaches a sound system comprising, a source of related electrical signal components(see fig.3), a pair of electroacoustical transducer arrays, each of the arrays comprising a plurality of electroacoustical transducers driven respectively by said related electrical signal components(102,104, 106), and an input terminal to receive input audio electrical signals; and circuitry constructed and arranged to generate and control two related output audio electrical signals coupled to said electraocoustical transducers of an array(see fig.3), to control the two output signals to achieve reduced cancellation of acoustic signals produced by the transducers at frequencies below F_D = c/2D(because the entire frequency is reduced in acoustic signal canceling and thus includes the frequency range that is below F_D and applicant does not point out the limitation below F_D only, therefore, it meets the limitation as recited in claimed), in which D is an inter-transducer distance and c is the speed of sound, the controlling being done as a function of at least one of a volume control (108) or a detected signal level, the reduction in cancellation changing a radiated acoustic power spectrum of the array at frequencies below F_D (see figs. 3-4 and col. 4 line 10-col. 5 line 48); but Rocha does not explicitly teach equalizing the audio electrical signals based on the change in the spectrum.

However, Markow teaches equalizing the audio electrical signals below F_D based on the change in the spectrum (because the entire frequency includes the frequency range that is below F_D)(see figs. 2-4 and col. 4 line 50-col. 5 line 6 and col. 6 line 35-col. 7 line 67).

Rocha as modified by Markow teaches equalizing the audio electrical signals below F_D based on the change in the spectrum.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Markow into Rocha to provide in order to enhance spatial sound impression to the listener.

Consider claim 20 Rocha as modified by Markow teaches the electroacoustical transducing apparatus wherein said ,array comprises first and second closely spaced loudspeaker drivers having their axes angularly displaced by substantially 60 degrees (in Markow, see figs. 2-4 and col. 6 line 35-col. 7 line 67).

5. Claims 2, 6-8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rocha (US PAT. 6,118,883) as modified by of Markow (US PAT. 6,175,489) as applied to claims 1, 11, and 15 above, and further in view of Greenberger (US PAT. 5,870,484).

Consider claim 2 Rocha as modified by Markow does not explicitly teach the method which the adjusting equalization to compensate for the change in the acoustic power spectrum comprises maintaining the radiated relative acoustic power spectrum substantially uniform.

However, Greenberger discloses the adjusting equalization to compensate for the change in the acoustic power spectrum comprises maintaining the radiated relative acoustic power spectrum substantially uniform (Figs. 2-10, 13, 15-19, 21-22, and 26-29; column 1, lines 1-32; column 3, line 31 to column 4, line 24; column 37, lines 34-59; column 40, lines 5- 48; column 48, lines 41 to column 50, line 62; column 51, line 42 to column 52, line 15; column 55, lines 22-65; column 56, lines 13-23; column 58, line 39 to column 59, line 47).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Greenberger into the teaching of Rocha and Markow to create a signal dependent radiation pattern, where the total radiated power of each stereo channel signal radiated is constant as a function of frequency, over the frequency range where directivity pattern control is maintained.

Consider claim 6 Rocha as modified by Markow does not explicitly teach the method which the adjusting is based on a signal level detected in the controlled audio electrical signals.

However, Greenberger discloses the adjusting is based on a signal level detected in the controlled audio electrical signals (Figs. 2-10, 13, 15-19, 21- 22, and 26-29; column 1, lines 1-32; column 3, line 31 to column 4, line 24; column" 37, lines 34-59; column 40, lines 5-48; column 48, lines 41 to column 50, line 62; column 51, line 42 to column 52, line 15; column 55, lines 22-65; column 56, lines 13-23; column 58, line 39 to column 59, line 47).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Greenberger into the teaching of Rocha and Markow to provide the mono blend noise reduction function.

Consider claim 7 Rocha as modified by Markow does not explicitly teach the method which the controlling comprises reducing the amplitude of one of the audio electrical signals for higher acoustic volume levels.

However, Greenberger discloses the controlling comprises reducing the amplitude of one of the audio electrical signals for higher acoustic volume levels (Figs. 2-10, 13, 15-19, 21-22, and 26-29; column 1, lines 1-32; column 3, line 31 to column 4, line 24; column 37~ lines 34-59; column 40, lines 5-48; column 48, lines 41 to column 50, line 62; column 51, line 42 to column 52, line 15; column 55, lines 22-65; column 56, lines 13-23; column 58, line 39 to column 59, line 47).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Greenberger into the teaching of Rocha and Markow to generate the required localization cues for a listener to perceive sound sources located at various positions throughout a listening room by controlling the level of sound directly radiated at the listener vs. the level of sound reflected off of wall surfaces in specific directions over specific frequency ranges.

Consider claim 8, Greenberger discloses the controlling comprises combining two components of an intermediate electrical signal in selectable proportions (Figs. 2- 10, 13, 15-19, 21-22, and 26-29; column 1, lines 1-32; column 3, line 31 to column 4, line 24; column 37, lines 34-59; column 40, lines 5-48; column 48, lines 41 to column 50,

line 62; column 51, line 42 to column 52, line 15; column 55, lines 22-65; column 56, lines 13-23; column 58, line 39 to column 59, line 47 and discussion above claim 7).

Consider claim 18 Rocha as modified by Markow does not explicitly teach the apparatus also comprising a second input terminal to carry a signal indicating a volume level for use by the circuitry.

However, Greenberger discloses a second input terminal to carry a signal indicating a volume level for use by the circuitry (Figs. 2-10, 13, 15-19, 21-22, and 26-29; column 1, lines 1-32; column 3, line 31 to column 4, line 24; column 37,'lines 34-59; column 40, lines 5-48; column 48, lines 41 to column 50, line 62; column 511 line 42 to column 52, line 15; column 55, lines 22-65; column 56, lines 13-23; column 58, line 39 to column 59, line 47).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Greenberger into the teaching of Rocha and Markow to provide a volume control device to be more friendly for the user.

Response to Arguments

6. Applicant's arguments with respect to claims 1-9 and 11-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Short (US PAT. 4,739,514) is recited to show how other related ELECTROACOUSTICAL TRANSDUCING.

8. Any response to this action should be mailed to:

Mail Stop ____(explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents
P.O. Box 1450
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Facsimile responses should be faxed to:
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401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (571) 272-7501 The examiner can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao,Lun-See
/Lun-See Lao/
Examiner, Art Unit 2615
Patent Examiner
US Patent and Trademark Office
Knox
571-272-7501
Date 06-09-2008

/Vivian Chin/

Supervisory Patent Examiner, Art Unit 2615